ABSTRACT

A filament, heat shield, supporting base comprised of SiC with ceramic insulators and top plate that together form an effusion assembly for use in the vacuum evaporation, molecular beam epitaxy, and ultra high vacuum deposition of epitaxial materials. The effusion assembly used together with a crucible and source material allow for the vacuum evaporation of species above 1250 °C when quantities of reactive gaseous species such as oxygen, sulphur, or reactive nitrogen are present in the deposition chamber. The relative chemical inertness of SiC even at elevated temperatures allows the SiC filament assembly to be used at high temperature especially in the presence of oxygen for the high purity epitaxial nucleation and growth layered electronic materials including semiconductors, metals, oxides, dielectric multilayer stacks, sulfides and oxides.